

ABSTRACT OF THE DISCLOSURE

5 A beam control system and method which utilizes the wavefront reversal
property of nonlinear optical phase conjugation to permit incorporation of a liquid
crystal OPA within the low power legs of the beam control system, thereby affording
the advantages of the OPA without the power limitations thereof. The invention is
adapted for use with a beacon for illuminating a target with a first beam of
10 electromagnetic energy. The system includes a telescope (1010) for receiving a target
return comprising a reflection of the first beam from the target. An optical phased array
(1050) is included for correcting for aberrations in the wavefront of the target return. A
mechanism is included for ascertaining the correction applied by the optical phased
array to the target return. The mechanism applies the correction to a third beam which
15 ultimately is the output beam. In the illustrative embodiment, the first beam of
electromagnetic energy is optical energy and the mechanism includes a first phase
conjugate mirror (1091) adapted to conjugate electromagnetic energy output by the third
mechanism and a second phase conjugate mirror (1092) adapted to conjugate the output
of the first phase conjugate mirror. The fourth mechanism further includes an amplifier
20 (1088) for boosting the signal output by the second phase conjugate mirror (1092) to
provide the output beam.